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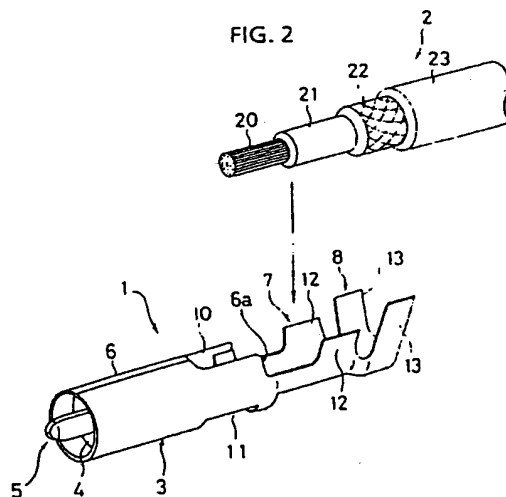
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(54) Electrical connector.

(57) An electrical connector for a shield cable which includes a shield sleeve portion (3) including a contact holding portion (6) having a jig entrance (10) extending forwardly from a rear edge thereof, a shield wires crimping portion (7) having a pair of crimping tabs (12), and an outer sheath crimping portion (8) having a pair of crimping tabs (13); and a signal line contact (5) having a contact body (14) and a pair of crimping tabs (17) to which a signal line of the shield cable is to be connected by crimping and placed within the contact holding portion via an insulation body so that the crimping portion is positioned within the jig entrance.



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ELECTRICAL CONNECTOR

Background of the InventionField of the Invention

The present invention relates to a connector for shield cables of electronic controls in an automobile for example.

Description of the Prior Art

Fig. 12 shows a conventional connector of this type which is made by removing a length of outer sheath **g** of a shield cable **a**; separating a shield wires **b** from a signal line **c**, bundling and connecting the shield wires **b** and the signal line **c** to the contact terminal **e** and the insulation displacement terminal **f** of a connector body **d**, respectively.

However, the removal of the outer shield **g**, the separation of the shield wires **b** from the signal line **c**, and the direction of the signal line **b** and the signal line **c** to the contact terminals **e** and **f** have been made by hands. The shield wires **b** and the signal line **c** have been connected separately to the contact terminals **e** and **f** by bundling the shield wires **b** while using the insulation displacing technique for the signal line **c**. Consequently, it has been difficult to streamline and automate the connection operations. In addition, the signal line **c** from which the shield wires **b** were removed has been susceptible to electromagnetic interferences.

Summary of the Invention

Accordingly, it is an object of the invention to provide a connector which permits simultaneous connection by crimping of the signal line, intermediate insulator, shield wires, and outer sheath of a shield cable, thereby making possible continuous and automatic connection of a large number of connectors.

It is another object of the invention to provide a connector which has the enhanced shielding effect.

According to the invention there is provided an electrical connector for a shield cable which includes a shield sleeve portion including a contact holding portion having a jig entrance extending forwardly from a rear edge thereof, a shield wires crimping portion having a pair of crimping tabs, and an outer sheath crimping portion having a pair of crimping tabs; and a signal line contact having a contact body and a pair of crimping tabs to which a signal line of the shield cable is to be connected by crimping and placed within the contact holding portion via an insulation body so that the crimping portion is positioned within the jig entrance.

The stripped front end of a shield cable is

placed on the electrical contact such that the signal line, intermediate insulator, shield wires, and outer sheath are positioned on the respective crimping tabs and simultaneously pressed with a crimping tool onto the crimping tabs for effecting connection, making possible continuous and automatic connection of a large number of connectors. The shield sleeve fully covers the signal line and the signal line contact, thus providing an excellent shielding effect.

The above and other objects, features, and advantages of the invention will be more apparent from the following description when taken in conjunction with the accompanying drawings.

Brief Description of the Drawings

Fig. 1 is a perspective view of a connector according to an embodiment of the invention before coupling;

Fig. 2 is a perspective view of an electrical contact terminal of the connector;

Fig. 3 is a perspective view of a signal line contact of the connector;

Fig. 4 is a side elevation of the electrical contact terminal;

Fig. 5 is a top plan view thereof;

Fig. 6 is a bottom plan view thereof;

Fig. 7 is a front elevation thereof viewed from the arrow VII-VII of Fig. 4;

Fig. 8 is a rear elevation thereof viewed from the arrow VIII-VIII of Fig. 4;

Fig. 9 is a sectional view taken along the line IX-IX of Fig. 4;

Fig. 10 illustrates how to crimp a shield cable to the electrical contact terminal;

Fig. 11 illustrates the electrical contact terminal to which the shield cable has been crimped; and

Fig. 12 is a perspective view of a conventional connector.

Description of the Preferred Embodiment

Fig. 1 shows a connector according to an embodiment of the invention before coupling. A connector **A** consists of a female connector **B** and a male connector **C**. The female connector **B** includes a housing **D** and an electrical contact terminal **1** therein.

As Figs. 2-9 show, the electrical contact terminal **1** has a shield sleeve **3**, an insulation body **4**, and a signal contact **5**. The shield sleeve **3** is divided into three portions; a tubular holder portion **6**, a shield crimping portion **7**, and a sheath retention portion **8**. Behind the contact holder portion **6** there are jig entrances **10** and **11**. The jig entrance

10 extends forwardly from the rear edge 6a of the contact holder portion 6. The shield crimping portion 7 has a pair of crimping tabs 12 forming a U-shaped cross section. The sheath retention portion 8 also has a pair of crimping tabs 13 forming a U-shaped cross section. The crimping tabs 13 are greater than the crimping tabs 12.

The signal line contact 5 is divided into three portions; a contact body 14, a signal line crimping portion 15, and an insulator crimping portion 16. The contact body 14 has the form of a pin while the signal line crimping portion 15 consists of a pair of crimping tabs 17. The insulator crimping portion 16 has a pair of crimping tabs 18 forming a U-shaped cross section. The signal line contact 5 is supported by the insulator 4 within the contact holder portion 6 of the contact terminal 1 such that the signal line crimping portion 15 and the insulator crimping portion 16 are placed in the jig entrance 10 and 11, respectively.

In order to connect the shield cable 2 to the contact terminal 1, as Fig. 2 shows, a length of outer sheath 23 of the shield cable 2 is removed to expose the signal line (central conductor) 20, the intermediate insulator 21, and the shield wires (outer conductor) 22. The shield cable 2 is placed on the contact terminal 1 such that the signal line 20, the intermediate insulator 21, the shield wires 22, and the outer sheath 23 are positioned at the signal line crimping tabs 17, the crimping tabs 18 of the insulator crimping portion 16, the crimping tabs 12 of the shield crimping portion, and the crimping tabs 13 of the sheath holder portion 3, respectively.

As Fig. 10 shows, the signal line 20, the intermediate insulator 21, the shield wires 22, and the outer sheath 23 are simultaneously connected to the signal line crimping tabs 17 and the other crimping tabs 18, 12, and 13 by crimping techniques, respectively, by means of anvils 24a, 24b, 25a, 25b, 26a, and 26b, and crimpers 27a and 27b. More specifically, the signal line anvils 24a and 24b and the crimpers 25a and 25b are inserted through the jig entrances 10 and 11, respectively, to press the signal line crimping tabs 17 and the insulator crimping tabs 18 for simultaneous connection of the signal line 20 and the intermediate insulator 21. In addition, the crimping tabs 12 and 13 are crimped to the shield wires 22 and the outer sheath 23 with the crimping anvils 26a and 26b and the crimpers 27a and 27b, respectively, to connect the shield cable 2 to the electrical contact 1. The electrical contact 1 is then inserted and fixed in the housing D to form a female connector B, which is coupled to the male connector C for making electrical connection.

As has been described above, with the connector according to the invention, it is possible to

simultaneously connect the signal line, the intermediate insulator, the shield wires, and the outer sheath to the respective crimping tabs with a crimping tool. This makes continuous connection of a large number of connectors possible and thus automation of the operation possible. The coverage by the shielding sleeve of the signal line and signal line contact increases and thus the shield effect.

Claims

1. An electrical connector for a shield cable comprising:
 - a shield sleeve portion including a contact holding portion having a jig entrance extending forwardly from a rear edge thereof, a shield wires crimping portion having a pair of crimping tabs, and an outer sheath crimping portion having a pair of crimping tabs; and
 - a signal line contact having a contact body and a crimping portion with a pair of crimping tabs to which a signal line of said shield cable is to be connected by crimping and placed within said contact holding portion via an insulator body so that said crimping portion is positioned within said jig entrance.

FIG. 1

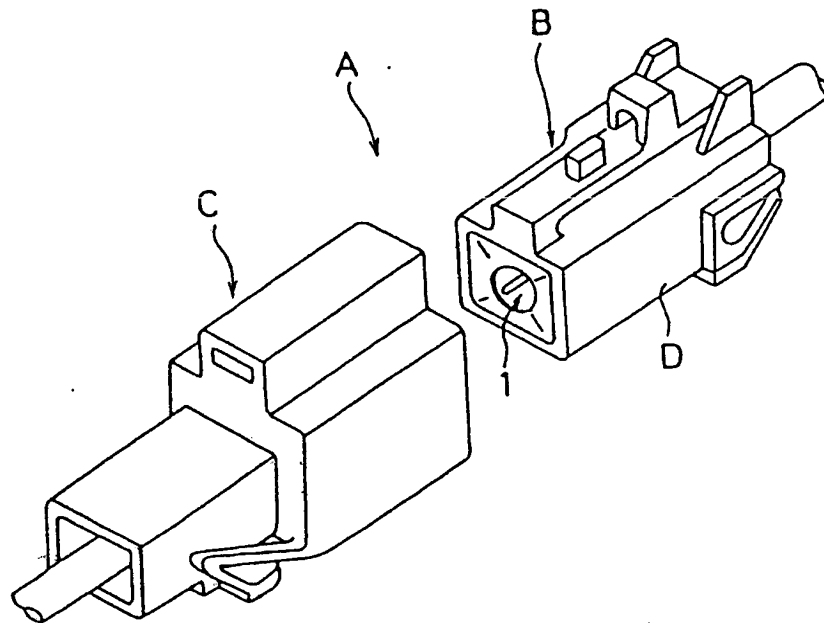


FIG. 12
PRIOR ART

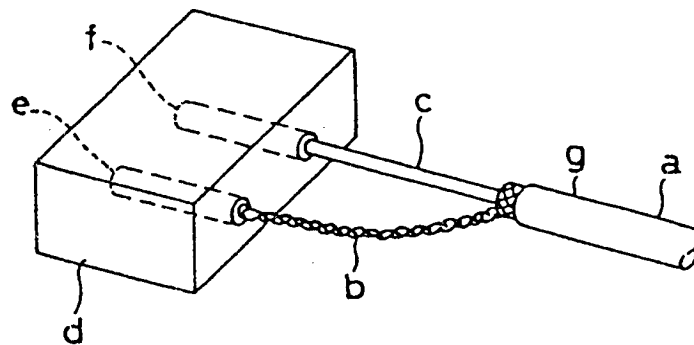


FIG. 2

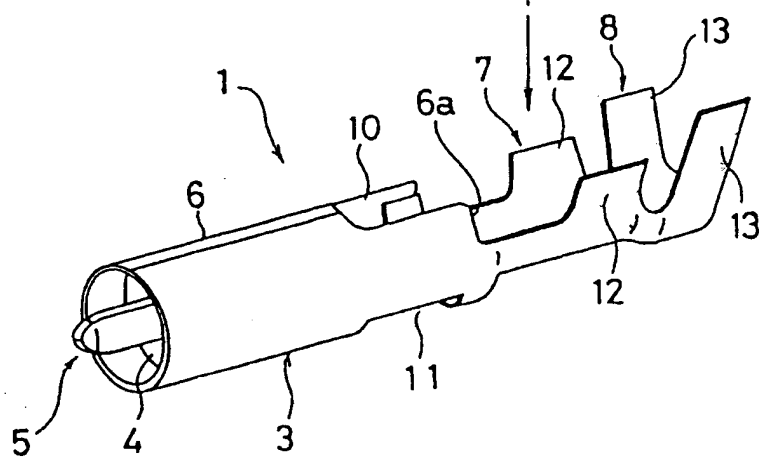
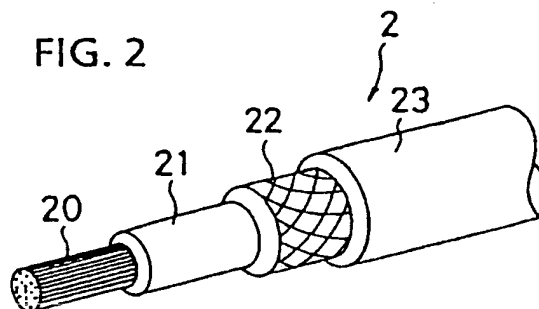


FIG. 3

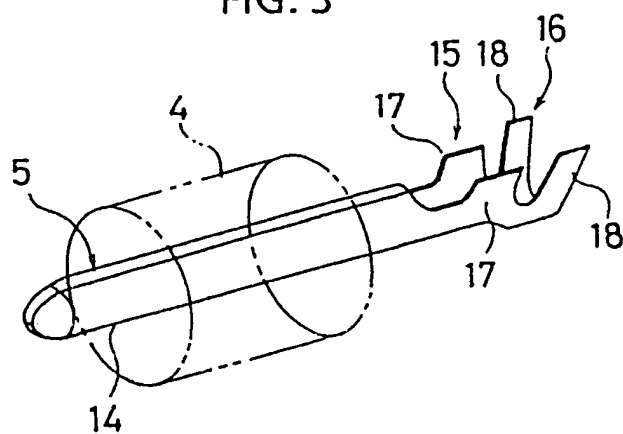


FIG. 4

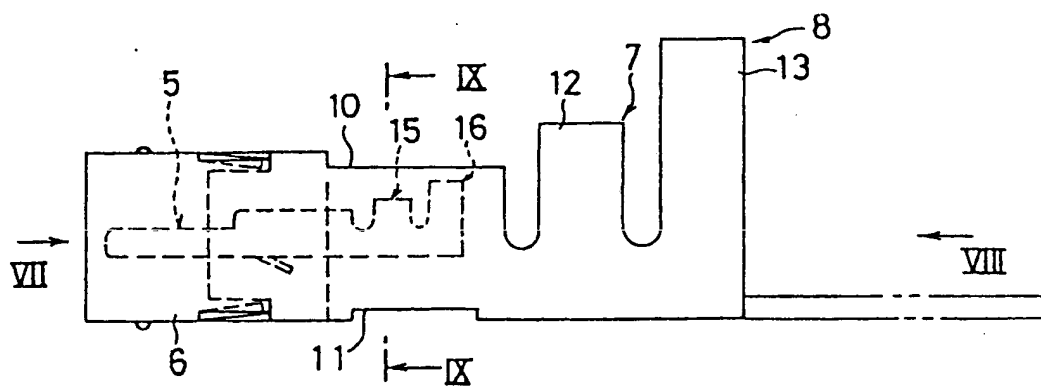


FIG. 5

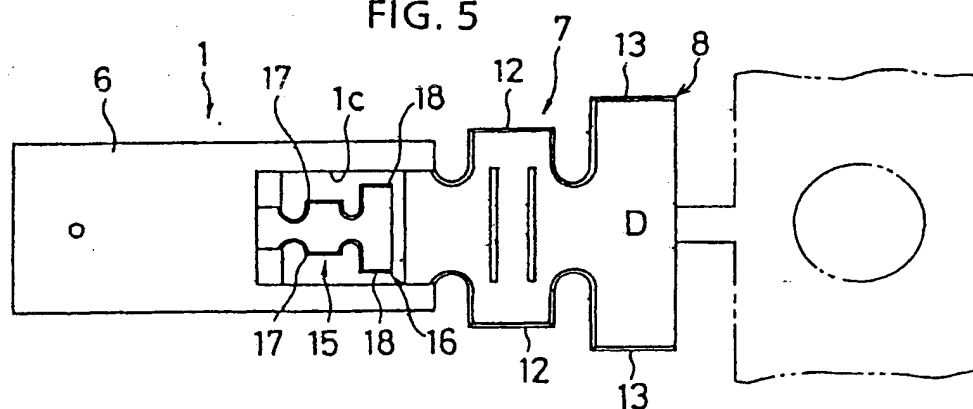


FIG. 6

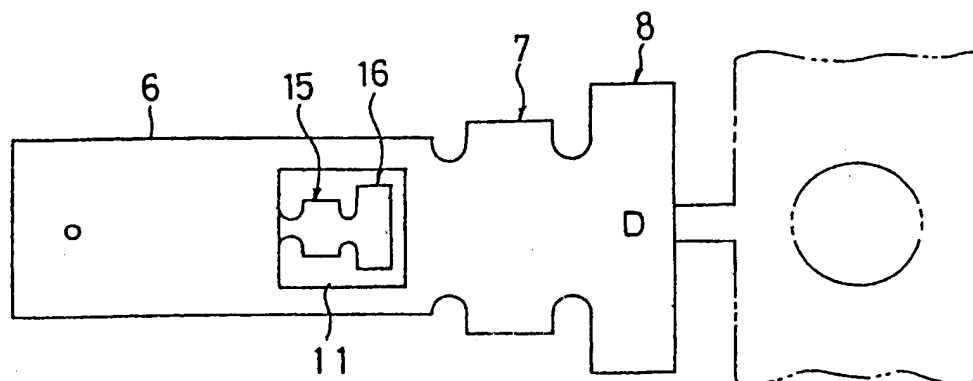


FIG. 7

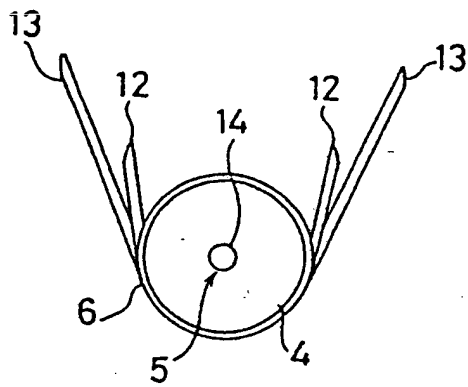


FIG. 8

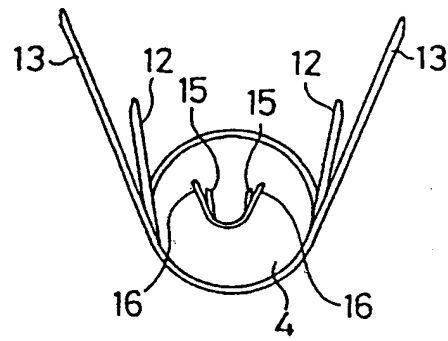


FIG. 9

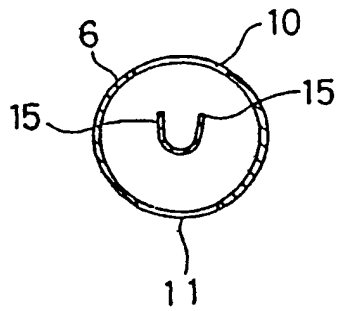


FIG. 10

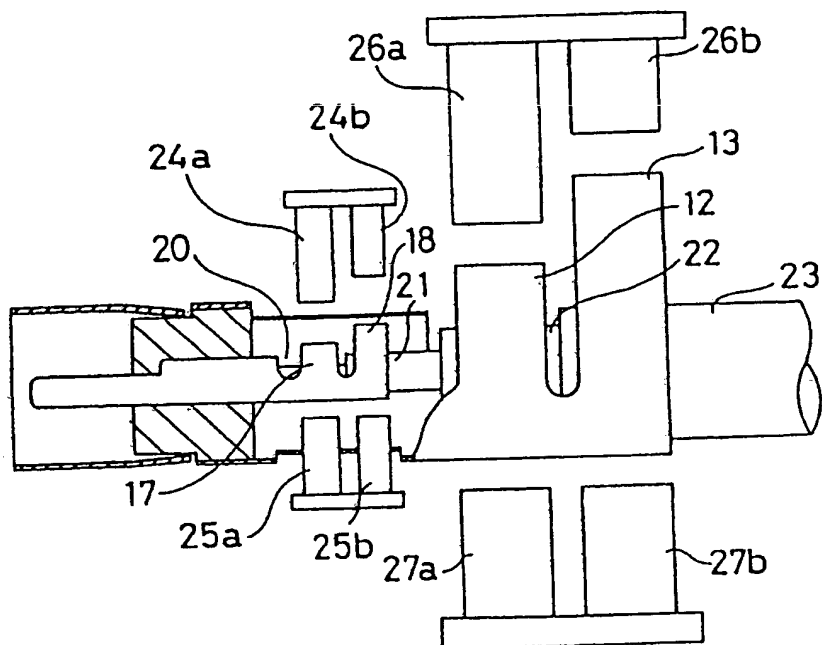
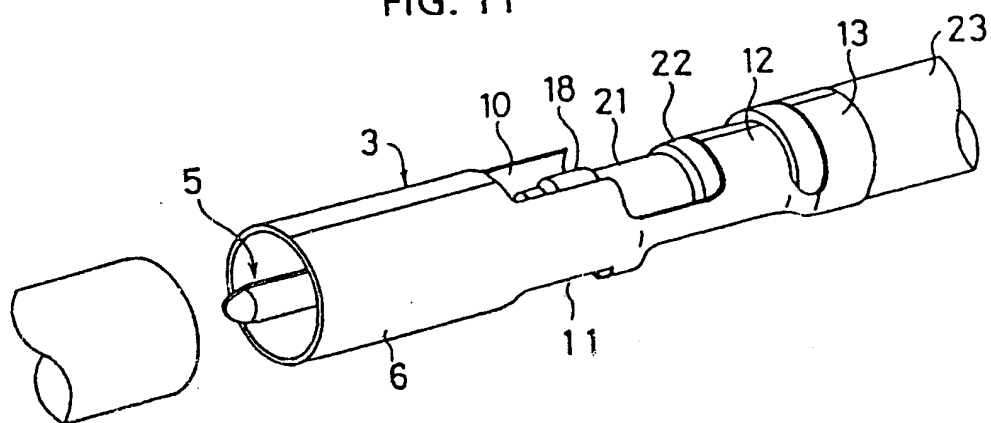


FIG. 11





European Patent
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EUROPEAN SEARCH REPORT

Application Number

EP 90 12 3574

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. C.L.S.)
Y	GB-A-2020919 (SOURIAU & CIE) * page 1, line 44 - page 2, line 9; figure 1 *	1	H01R9/05
Y	US-A-3484922 (FRITZ ET AL.) * column 3, lines 25 - 52; figure 7 *	1	
A	EP-A-0000996 (AMP INCORPORATED) * page 4, lines 13 - 20; figure 1 *	1	
A	EP-A-0168649 (JAPAN AVIATION ELECTRONICS)		
			TECHNICAL FIELDS SEARCHED (Int. C.L.S.)
			H01R
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 22 FEBRUARY 1991	Examiner KOHLER J.W.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		I : theory or principle underlying the invention F : earlier patent document, but published on, or after the filing date D : document cited in the application C : document cited for other reasons & : member of the same patent family, corresponding document	